

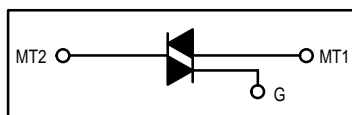
Advance Information

TRIACS

Silicon Bidirectional Thyristors

Designed for high performance full-wave ac control applications where high noise immunity and commutating di/dt are required.

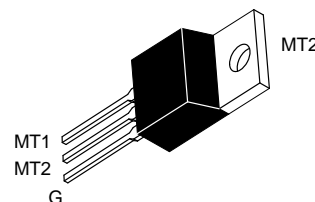
- Blocking Voltage to 800 Volts
- On-State Current Rating of 12 Amperes RMS at 70°C
- Uniform Gate Trigger currents in Three Modes
- High Immunity to dv/dt — 250 V/μs minimum at 125°C
- High Commutating di/dt — 6.5 A/ms minimum at 125°C
- Industry Standard TO-220 AB Package
- High Surge Current Capability — 120 Amperes



MAC12 SERIES*

*Motorola preferred devices

TRIACS
12 AMPERES RMS
400 thru 800
VOLTS



CASE 221A-09
(TO-220AB)
Style 4

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Repetitive Off-State Voltage ⁽¹⁾ ($T_J = -40$ to 125°C , Sine Wave, 50 to 60 Hz, Gate Open)	V_{DRM}	400 600 800	Volts
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, $T_C = 70^\circ\text{C}$)	$I_{\text{T(RMS)}}$	12	A
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, $T_J = 125^\circ\text{C}$)	I_{TSM}	100	A
Circuit Fusing Consideration ($t = 8.3$ ms)	I^2t	41	A ² sec
Peak Gate Power (Pulse Width ≤ 1.0 μs, $T_C = 80^\circ\text{C}$)	P_{GM}	16	Watts
Average Gate Power ($t = 8.3$ ms, $T_C = 80^\circ\text{C}$)	$P_{\text{G(AV)}}$	0.35	Watts
Operating Junction Temperature Range	T_J	-40 to +125	°C
Storage Temperature Range	T_{stg}	-40 to +150	°C

THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case — Junction to Ambient	$R_{\theta\text{JC}}$ $R_{\theta\text{JA}}$	2.2 62.5	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	°C

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Blocking Current ($V_D = \text{Rated } V_{\text{DRM}}$, Gate Open)	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	I_{DRM}	— —	0.01 2.0	mA
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(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

Preferred devices are Motorola recommended choices for future use and best overall value.

REV 2



MAC12 SERIES

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

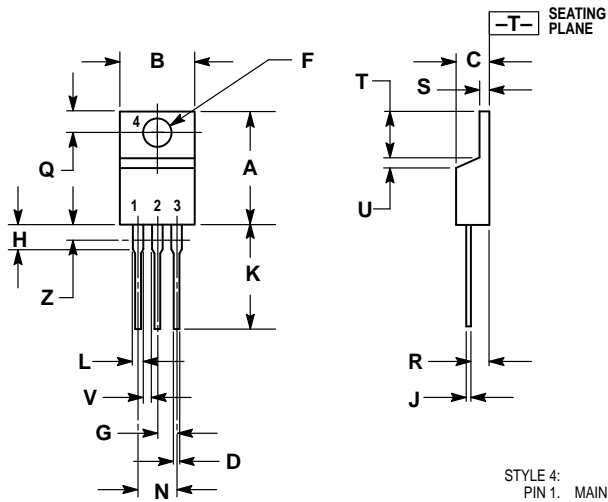
Peak On-State Voltage* ($I_{TM} = \pm 17\text{ A}$)	V_{TM}	—	—	1.85	Volts
Continuous Gate Trigger Current ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$)	I_{GT}	5.0	13	35	mA
MT2(+), G(+)		5.0	16	35	
MT2(+), G(-)		5.0	18	35	
MT2(-), G(-)					
Hold Current ($V_D = 12\text{ V}$, Gate Open, Initiating Current = $\pm 150\text{ mA}$)	I_H	—	20	40	mA
Latch Current ($V_D = 24\text{ V}$, $I_G = 35\text{ mA}$)	I_L	—	20	50	mA
MT2(+), G(+); MT2(-), G(-)		—	30	80	
MT2(+), G(-)					
Gate Trigger Voltage ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$)	V_{GT}	0.5	0.69	1.5	Volts
MT2(+), G(+)		0.5	0.77	1.5	
MT2(+), G(-)		0.5	0.72	1.5	
MT2(-), G(-)					

DYNAMIC CHARACTERISTICS

Rate of Change of Commutating Current* ($V_D = 400\text{ V}$, $I_{TM} = 4.4\text{ A}$, Commutating $dv/dt = 18\text{ V}/\mu\text{s}$, Gate Open, $T_J = 125^\circ\text{C}$, $f = 250\text{ Hz}$, No Snubber)	$(dv/dt)_c$	6.5	—	—	A/ms
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, Gate Open, $T_J = 125^\circ\text{C}$)	dv/dt	250	—	—	V/ μs

*Indicates Pulse Test: Pulse Width $\leq 2.0\text{ ms}$, Duty Cycle $\leq 2\%$.

PACKAGE DIMENSIONS




STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

CASE 221A-09
(TO-220AB)
ISSUE Z

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